



Climate Change and Waste Management

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Eugene Lee, Office of Solid Waste

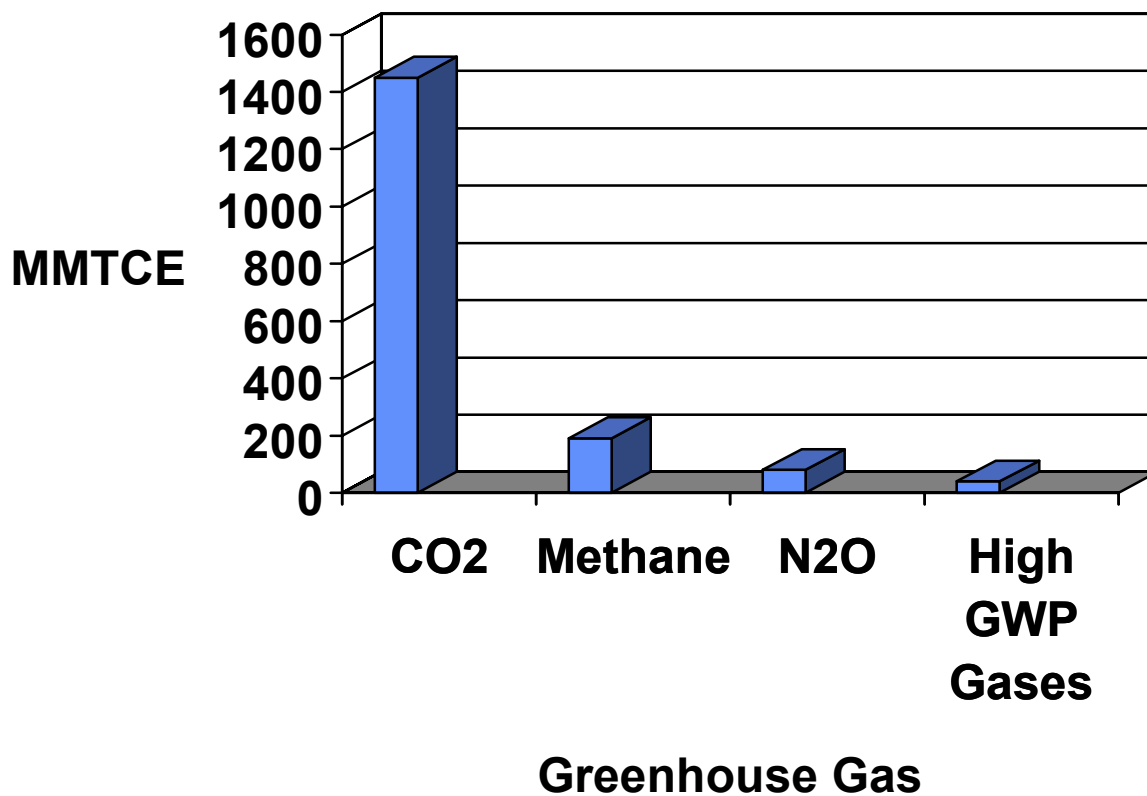




Session Overview

- *U.S. MSW Management Practices*
- *U.S. GHG Emissions*
- *Office of Solid Waste Climate Program Overview*
- *GHG Emission Factors for Waste Management*

U.S. Greenhouse Gas Emissions





U.S. Methane Emissions

- Landfills - 36%
- Enteric Fermentation - 19%
- Natural Gas Systems - 19%
- Coal Mining - 11%
- Manure Management - 9%
- Others - 5%



Program Objectives

- *President Clinton's Climate Change Action Plan Source Reduction and Recycling initiative targets 5 MMTCE in GHG reductions by 2000*
- *GHG reductions through selected programs: WasteWise, Pay-As-You-Throw, Climate Grants*
- *Research*



WasteWise Program

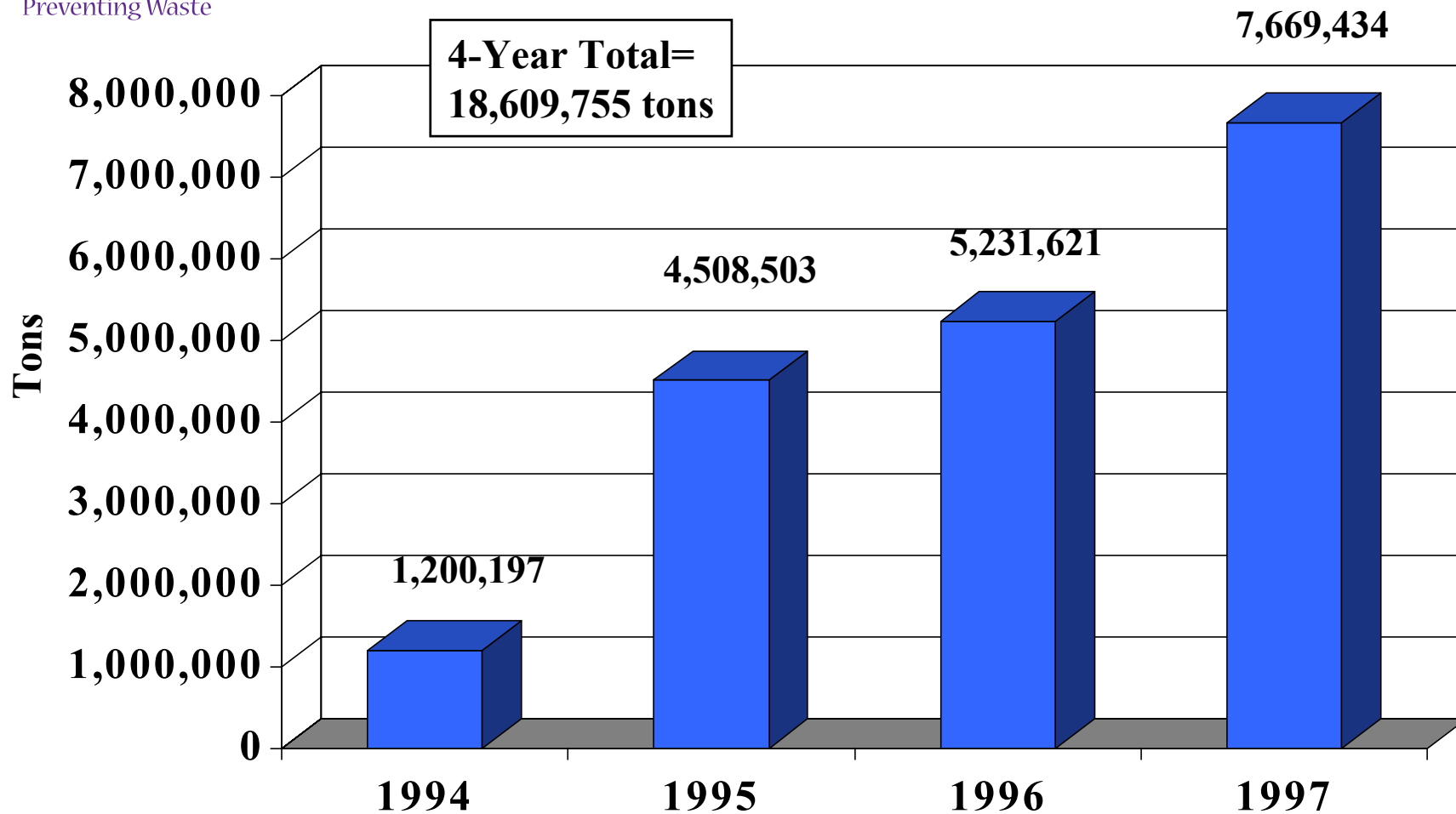
- Voluntary partnership program with over 800 partners
- Goals: waste prevention, buy/manufacture recycled products, and recyclables collection
- Report progress annually





Preserving Resources,
Preventing Waste

Waste Reduction Achievements



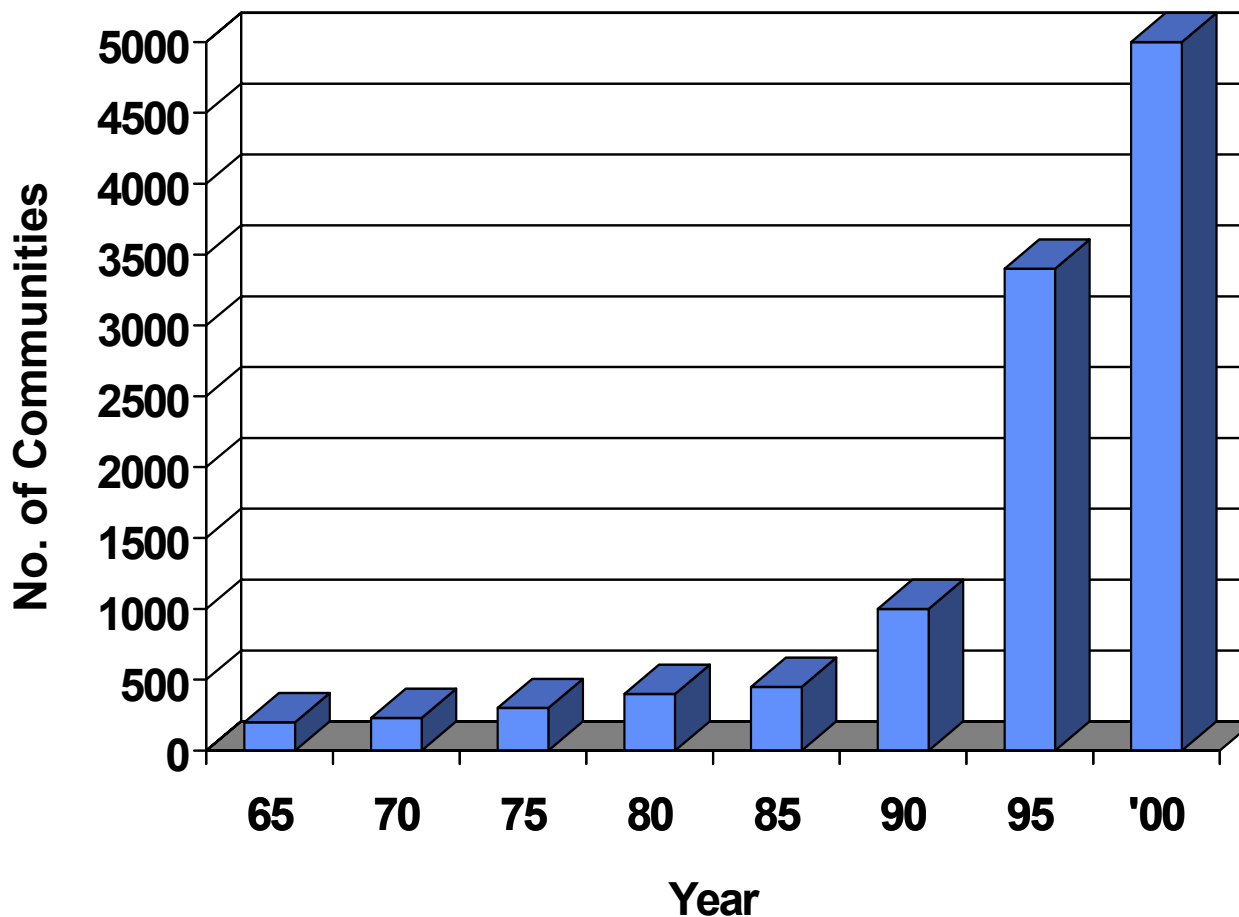
Waste reduction achievements refer to waste prevention and recycling results.

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Pay-As-You-Throw Program

- Economic incentive program for reducing waste
- Pay for trash like a utility
- The more you throw away, the more you pay
- Provide tools, technical assistance and grants

Growth in PAYT Programs



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Climate Innovative Waste Reduction Projects

- Support states and local governments
- Implement innovative waste reduction activities
- 30+ efforts ongoing in 25 States



RESEARCH

- Provide tools for policymakers and businesses to plan GHG reduction actions
- Developed emission factors to support GHG voluntary reporting activities



GHG REPORT

- *Waste materials*
 - Focused on major components of MSW -
 - paper (office, news, corrugated, mixed), aluminum cans, steel cans, plastics (HDPE, LDPE, PET), yard trimmings, food scraps, glass
- *5 waste management strategies:*
 - Source reduction, recycling, composting, combustion, landfilling



GHG REPORT METHODOLOGY

- Streamlined LCA—GHG emissions and sinks from MSW only:
 - Process and transportation in raw material acquisition and manufacturing stages
 - Process and transportation when recycling
 - Forest carbon storage from source reduction and recycling
 - Soil carbon storage when composting
 - Non-biomass GHG emissions from waste combustors
 - Decomposition in landfills



GHG EMISSIONS AND SINKS FROM SOURCE REDUCTION

- *No process or transportation emissions from materials acquisition or manufacturing*
- *Increase in forest carbon storage for paper products*
- *No emissions from waste management*



GHG EMISSIONS AND SINKS FROM RECYCLING

- *Lower emissions in manufacturing with recycled feedstocks*
- *Increase in forest carbon storage with paper products*
- *Some emissions from collection and processing of recyclables*
- *No emissions from waste disposal*



GHG EMISSIONS FROM COMBUSTION

- *CO₂ and N₂O emissions from non-biogenic sources (e.g., plastics)*
- *GHG reductions from energy recovery*
- *GHG reductions from ferrous recovery*



GHG EMISSIONS AND SINKS FROM LANDFILLING

- *Methane emissions*
- *GHG reductions from gas collection*
- *GHG reductions from energy recovery*
- *Carbon storage from undecomposed biogenic carbon*



GHG EMISSION FACTOR APPLICATIONS

- Supports climate change mitigation analysis
- Only intended for voluntary reporting of GHG reductions
- Methodology may assist other countries in developing their own emission factors



GHG Emission Factor Applications

- Emission factors used to measure impact of key EPA waste reduction programs:

- WasteWi\$e

- Flagship business waste-reduction program
- Just expanded to state and local gov't, over 800 partners now participating
- 1997 results:
 - 6.8 million tons recycled;
 - 816,000 tons reduced
- 5.0 million MTCE reduced



Limitations of Analysis

- Manufacturing GHG analysis is based on estimated industry averages
- Forest carbon sequestration values are based on computer modeling
- Combustion analysis uses U.S. averages
- Landfill analysis is based on limited laboratory data



Looking Forward

- **Future Activities:**
 - Hold dialogues with industry stakeholders
 - Continue work with states and local governments
 - Develop international partnerships